

1-31. (Canceled)

32. (New) An isolated and purified nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 13, or a part thereof.

33. (New) The nucleic acid molecule according to claim 32 wherein the molecules are from about 10 to 20 nucleotides in length.

34. (New) A composition comprising an isolated nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 13, or a part thereof.

35. (New) The composition of claim 34, further comprising one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 68, or a part thereof.

36. (New) The composition according to claim 34 or 35 wherein the molecules are from about 10 to 20 nucleotides in length.

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

1. 37. **(New)** A primer comprising a nucleotide sequence corresponding to the nucleotide sequence from position 586 to 606 or position 791 to 810 of SEQ ID NO: 13.

38. **(New)** A composition comprising the primer according to claim 37.

39. **(New)** A composition comprising the primer according to claim 37, and further comprising one or more primers comprising a nucleotide sequence corresponding to any of primer 1 or primer 2 in the table below:

SEQ ID NO:	H specificity	Positions of primer 1	Positions of primer 2
66	1	892-909	1172-1189
67	2	568-587	1039-1056
6, 17, 42	4	466-483	628-648
7	5	697-714	877-897
8	6	565-585	799-816
9	7	553-570	1483-1500

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

11	9	616-633	838-855
12 (49)	10	559-579	697-717
14	12	892-909	1172-1189
15	14	586-606	793-813
16	15	640-660	817-834
68	16	649-666	925-942
18	18	589-606	802-819
17	19	607-624	538-855
20	20	574-591	760-780
21, 46	21	676-693	862-879
22	23	637-654	1336-1353
23	24	496-516	772-792
25	26	553-570	772-789
26	27	685-702	799-819
27	28	592-609	778-798
28	29	538-555	757-774
29	30	814-831	943-962
30	31	571-588	790-807
31	32	514-831	1057-1074
32	33	553-570	718-735
33	34	568-585	796-816

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

36, 53	38	553-573	709-729
37	39	556-573	718-735
39	41	598-615	784-801
40	42	547-567	715-735
41	43	580-597	844-861
43	45	640-657	943-963
44	46	565-582	781-801
48	49	589-609	754-771
50	51	565-582	1042-1059
51	52	598-615	829-846
54	56	697-714	877-897
10 and 38		562-579	1045-1062
24		529-549	703-723
34		769-789	1045-1065
35		520-537	715-735
47		568-585	835-852
52		988-1008	1344-1364

40. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 32, in conditions sufficient to allow the nucleic acid molecule to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and

(b) detecting whether the nucleic acid molecule is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

41. **(New)** A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 32 and one or more nucleic acid molecules comprising a nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one of the nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and

(b) detecting whether one or more of the at least one nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

42. (New) A method according to claim 40 or 41 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.

43. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 32, in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule with a complementary nucleic acid sequence; and

(b) detecting whether the pair of nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

44. (New) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 32 and one or more pairs of nucleic acid molecules comprising a nucleic acid sequence of all or part of any one of SEQ ID NO: 1 to 12

or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof, in conditions sufficient to allow at least one pair of nucleic acid molecules to hybridise to a nucleic acid molecule with a complementary nucleic acid sequence; and

(b) detecting whether one or more of the at least one pairs of nucleic acid molecules is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

45. **(New)** A method according to claim 43 or 44 wherein the hybridised pair of nucleic acid molecules are detected by the polymerase chain reaction.

46. **(New)** A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a nucleic acid molecule selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45,

wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45,

wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45,

wbdM (nucleotide position 11821 to 12945 of SEQ ID NO:45,

wbdN (nucleotide position 79 to 861 of SEQ ID NO:56),

wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56),

wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO:56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO:56),
in conditions sufficient to allow the nucleic acid molecule to
hybridise to a nucleic acid molecule having a complementary
nucleic acid sequence;

(b) contacting a gene of an *E. coli* in the sample with a
nucleic acid molecule according to claim 32, in conditions
sufficient to allow the nucleic acid molecule to hybridise to a
nucleic acid molecule having a complementary nucleic acid
sequence; and

(c) detecting whether the nucleic acid molecules are
hybridised to the genes, to detect the H and O serotype of the
E. coli in the sample.

47. **(New)** A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a nucleic acid
molecule selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO:45,
wzx (nucleotide position 8646 to 9911 of SEQ ID NO:45,

wzy (nucleotide position 9901 to 10953 of SEQ ID NO:45,
wbdM (nucleotide position 11821 to 12945 of SEQ ID NO:45,
wbdN (nucleotide position 79 to 861 of SEQ ID NO:56),
wbdO (nucleotide position 2011 to 2757 of SEQ ID NO:56),
wbdP (nucleotide position 5257 to 6471 of SEQ ID NO:56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO:56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO:56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO:56),
in conditions sufficient to allow the nucleic acid molecule to
hybridise to a nucleic acid molecule having a complementary
nucleic acid sequence;

(b) contacting a gene of an *E. coli* in the sample with a
nucleic acid molecule according to claim 32 and one or more
nucleic acid molecules comprising a nucleotide sequence of
any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57
to 68 or a part thereof, in conditions sufficient to allow at
least one of the nucleic acid molecules to hybridise to a
nucleic acid molecule having a complementary nucleic acid
sequence; and

(c) detecting whether the nucleic acid molecules are
hybridised to the genes, to detect the H and O serotype of the
E. coli in the sample.

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

48. (New) A method according to claim 46 or 47 wherein the nucleic acid molecule of step (a) is a forward primer or a reverse primer selected from the group of

Forward primer (base position of SEQ ID NO:1)	Reverse Primer (base position of SEQ ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430
12258-12275	12698-12681

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

Forward primer (base position of SEQ ID NO:2)	Reverse Primer (base position of SEQ ID NO:2)
79-96	861-844
184-201	531-514
310-327	768-751
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

49. **(New)** A method according to claim 46 or 47 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.

50. **(New)** A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a pair of nucleic acid molecules selected from the group consisting of: *wbdH* (nucleotide position 739 to 1932 of SEQ ID NO:45, *wzx* (nucleotide position 8646 to 9911 of SEQ ID NO:45, *wzy* (nucleotide position 9901 to 10953 of SEQ ID NO:45, *wbdM* (nucleotide position 11821 to 12945 of SEQ ID NO:45, *wbdN* (nucleotide position 79 to 861 of SEQ ID NO:56), *wbdO* (nucleotide position 2011 to 2757 of SEQ ID NO:56), *wbdP* (nucleotide position 5257 to 6471 of SEQ ID NO:56), *wbdR* (nucleotide position 13156 to 13821 of SEQ ID NO:56), *wzx* (nucleotide position 2744 to 4135 of SEQ ID NO:56) and *wxy* (nucleotide position 858 to 2042 of SEQ ID NO:56) in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence;

(b) contacting a flagellin gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 32, in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to a nucleic acid molecule having a complementary nucleic acid sequence; and

(c) detecting whether the pairs of nucleic acid molecules are hybridised to the genes, to detect the H and O serotype of the *E. coli* in the sample.

51. **(New)** A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a pair of nucleic acid molecules selected from the group consisting of: *wbdH* (nucleotide position 739 to 1932 of SEQ ID NO:45, *wzx* (nucleotide position 8646 to 9911 of SEQ ID NO:45, *wzy* (nucleotide position 9901 to 10953 of SEQ ID NO:45, *wbdM* (nucleotide position 11821 to 12945 of SEQ ID NO:45, *wbdN* (nucleotide position 79 to 861 of SEQ ID NO:56), *wbdO* (nucleotide position 2011 to 2757 of SEQ ID NO:56), *wbdP* (nucleotide position 5257 to 6471 of SEQ ID NO:56), *wbdR* (nucleotide position 13156 to 13821 of SEQ ID NO:56), *wzx* (nucleotide position 2744 to 4135 of SEQ ID NO:56) and

wxy (nucleotide position 858 to 2042 of SEQ ID NO:56)
in conditions sufficient to allow the pair of nucleic acid
molecules to hybridise to a nucleic acid molecule having a
complementary nucleic acid sequence;

(b) contacting a gene of an *E. coli* in the sample with a
pair of nucleic acid molecules according to claim 32 and one
or more pairs of nucleic acid molecules comprising a sequence
of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or
57 to 68 or a part thereof, in conditions sufficient to allow
at least one pair of nucleic acid molecules to hybridise to a
nucleic acid molecule having a complementary nucleic acid
sequence; and

(c) detecting whether the pairs of nucleic acid molecules
are hybridised to the genes, to detect the H and O serotype of
the *E. coli* in the sample.

52. **(New)** A method according to claim 50 or 51 wherein the
nucleic acid molecules of the pair of step (a) are a primer
pair comprising a forward primer and a reverse primer
selected from

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

Forward primer (base position of SEQ ID NO:1)	Reverse Primer (base position of SEQ ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430
12258-12275	12698-12681

Forward primer (base position of SEQ ID NO:2)	Reverse Primer (base position of SEQ ID NO:2)
79-96	861-844

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

184-201	531-514
310-327	768-751
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

53. **(New)** A method according to claim 50 or 51 wherein the hybridised pairs of nucleic acid molecules are detected by the polymerase chain reaction.

54. **(New)** A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 32, in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene; and

(b) detecting whether the nucleic acid molecule is hybridised to the gene, to detect the H and O serotype of *E. coli* in the sample.

55. **(New)** A method according to claim 50 wherein the gene of an *E. coli* in the sample is contacted with a nucleic acid molecule according to claim 32, and a nucleic acid molecule comprising the nucleotide sequence of any one of SEQ ID NOS: 9, 55, 57 to 65 or a part thereof.

56. **(New)** A method according to claim 40 or 41 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

57. (New) A kit for identifying the H serotype of *E. coli*, the kit comprising a nucleic acid molecule according to claim 32, a primer according to claim 37, or a composition according to claim 34, 35 or 39.

58. (New) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:

(a) a nucleic acid molecule according to claim 32; and

(b) at least one nucleic acid molecule selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45),
wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45),
wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45),
wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45),
wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56),
wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56),
wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).

59. (New) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:

(a) a nucleic acid molecule according to claim 32 and one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 44 or 46 to 55 or 57 to 68 or a part thereof; and

(b) at least one nucleic acid molecule selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45),
wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45),
wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45),
wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45),
wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56),
wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56),
wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).

60. (New) A kit according to claim 58 or 59 wherein the composition of (b) comprises a forward primer or a reverse primer selected from the group of

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

Forward primer (base position of SEQ ID NO:1)	Reverse Primer (base position of SEQ ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430
12258-12275	12698-12681

Forward primer (base position of SEQ ID NO:2)	Reverse Primer (base position of SEQ ID NO:2)
---	---

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

79-96	861-844
184-201	531-514
310-327	768-751
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

primers shown in the Tables above.

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

61. (New) A kit according to claim 58 or 59 wherein the composition of (a) comprises a forward primer and a reverse primer selected from the group of

Forward primer (base position of SEQ ID NO:1)	Reverse Primer (base position of SEQ ID NO:1)
739-757	1941-1924
925-942	1731-1714
925-942	1347-1330
1165-1182	1731-1714
8646-8663	9908-9891
8906-8923	9468-9451
9150-9167	9754-9737
9976-9996	10827-10807
10113-10130	10484-10467
10931-10949	11824-11796
11821-11844	12945-12924
12042-12059	12447-12430
12258-12275	12698-12681

REPLY AND AMENDMENT filed December 31, 2003
U.S. Serial No. 09/701,132
LISTING OF CLAIMS

Forward primer (base position of SEQ ID NO:2)	Reverse Primer (base position of SEQ ID NO:2)
79-96	861-844
184-201	531-514
310-327	768-751
858-875	2042-2025
1053-1070	1619-1602
1278-1295	1913-1896
2011-2028	2757-2740
2110-2127	2493-2476
2305-2322	2682-2665
2744-2761	4135-4118
2942-2959	3628-3611
5257-5274	6471-6454
5440-5457	5973-5956
5707-5724	6231-6214
13261-13278	13629-13612
13384-13401	13731-13714

forward and reverse primers shown in the Tables above.

62. **(New)** A method according to claim 43 or 44 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

63. **(New)** A method according to claim 46 or 47 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

64. **(New)** A method according to claim 50 or 51 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

65. **(New)** A method according to claim 54 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

66. (New) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:

(a) at least one primer according to claim 37 or a composition according to claim 39; and

(b) at least one nucleic acid molecule selected from the group consisting of:

wbdH (nucleotide position 739 to 1932 of SEQ ID NO: 45),
wzx (nucleotide position 8646 to 9911 of SEQ ID NO: 45),
wzy (nucleotide position 9901 to 10953 of SEQ ID NO: 45),
wbdM (nucleotide position 11821 to 12945 of SEQ ID NO: 45),
wbdN (nucleotide position 79 to 861 of SEQ ID NO: 56),
wbdO (nucleotide position 2011 to 2757 of SEQ ID NO: 56),
wbdP (nucleotide position 5257 to 6471 of SEQ ID NO: 56),
wbdR (nucleotide position 13156 to 13821 of SEQ ID NO: 56),
wzx (nucleotide position 2744 to 4135 of SEQ ID NO: 56) and
wzy (nucleotide position 858 to 2042 of SEQ ID NO: 56).

36. 67. (New) A kit for identifying the H serotype of *E. coli*, the kit comprising a nucleic acid molecule according to claim 32 and one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12, 14 to 44, 46 to 55 or 57 to 68 or a part thereof.

37. 68. (New) A kit comprising a nucleic acid molecule according to claim 32 and one or more nucleic acid molecules comprising the nucleotide sequence of any one of SEQ ID NO: 1 to 12 or 14 to 68 or a part thereof.